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LYGUS BUGS ON COTTON

HOW
TO
CONTROL
THEM



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LYGUS BUGS ON COTTON

. . . *how to control them*

Lygus bugs¹ are the principal insect pests of cotton in western areas of the United States; they are especially destructive where extensive alfalfa hay and seed crops are produced near cottonfields, and where large pasture areas dry up in early summer. In the South lygus bugs often become abundant on weeds and leguminous crops, and may move to nearby cotton and cause severe damage.

DEVELOPMENT

Lygus bugs develop in three stages—egg, nymph, and adult.

Female adults use their swordlike ovipositors to lay eggs in plant tissues, particularly in stems and leaf petioles. Eggs are tiny, elongate, and slightly curved.

Nymphs hatch from the eggs. They resemble adults in general appearance, but do not have fully developed wings; they can run rapidly, but cannot fly. They molt five times before becoming

adults. The life cycle is completed in about 4 weeks in summer; it takes longer in other seasons.

Adults are flat and about one-fourth inch long. They range in color from straw green to dark brown, and have a conspicuous lighter colored triangle between the wings.

When disturbed by the cutting of a host crop such as alfalfa, or when the plants are no longer attractive as food, adults fly to another host crop; they can fly readily from field to field. They hide in plant foliage during the day when the weather is hot.

HOST PLANTS

Western areas

In western areas of the United States, lygus bugs may develop on weeds such as wild mustard. They develop large populations on alfalfa, especially when the alfalfa is grown for seed.

When lygus bugs infest an alfalfa hay crop, they have time to produce one generation between cuttings. The crop is cut several times in a season, and is a constant source of infestation for cotton.

¹ *Lygus hesperus* is the predominant species in western areas; *L. lineolaris*, known as the tarnished plant bug, is prevalent in the South. Other species of lygus bugs damage cotton, but usually are of minor importance.



BN-13920-X

Adult lygus bug.

An alfalfa seed crop requires at least 60 days before the seeds are mature and ready to harvest. This allows time for two or more generations of lygus bugs to develop in very large numbers. If not controlled they may destroy the entire seed crop.

Lygus adults leave alfalfa soon after a seed crop matures or a hay crop is cut. If cotton is growing nearby, the pests may move to it in large numbers and gradually disperse over the entire cottonfield. If other alfalfa is growing in the vicinity, they may move into it in preference to remaining in the cotton.

Southern areas

In southern areas, alfalfa and other legumes may serve as hosts for lygus bugs. Weed hosts, however, are more often responsible for the lygus populations that move to cotton.

The more important weed hosts are butterweed, fleabane, goldenrod, aster, and dog fennel. When weed hosts ma-

ture or become otherwise unsatisfactory for feeding purposes, lygus bugs usually migrate to cotton if it is growing nearby.

Weed hosts and alfalfa should be examined in time to detect and control lygus bug infestations before the pests can migrate to cotton.

DAMAGE

Lygus bugs feed by inserting their long, needlelike mouthparts into plant tissues and sucking out the juices. On cotton, they attack the tender terminal growth, squares, flowers, and young bolls. Injured squares and small bolls usually drop. Injured bolls that do not drop may open abnormally and produce inferior lint that clings to the warty carpels that result from lygus feeding.

Lygus damage reduces the yield; it causes the lint to be spotted and lower in grade. Injured plants develop abnormally; they become tall and whip-like, and have fewer fruiting branches.



BN-13916-X

Lygus nymph in last molting stage.



BN-13921-X

Lygus eggs in stem of cotton plant.

USING INSECTICIDE

When a damaging infestation of lygus bugs is present on cotton, the only way to control it is by applying insecticide. Two applications usually give satisfactory control; occasionally, three may be required.

When to apply

The Extension Service in each cotton-producing State issues an annual guide for controlling cotton insects. Start your insecticide applications when infestation reaches the level specified in your State guide. You can obtain a copy from your county agricultural agent or State agricultural college.

To determine the infestation level, make a sweep count at each of four or more locations in a cottonfield. You can accomplish this by making 50 or 100 passes with a sweep net through the tops of plants in 1 row in each loca-

tion, holding the net so its lower edge slightly precedes its upper edge. Count the number of lygus bugs collected in the net, including the nymphs. Make the sweepings at 5- to 7-day intervals, beginning when squares start to develop on the plants and continuing until early September. When you know the number of lygus bugs a sweeping has collected, you can refer to your State guide to learn if it is time to apply insecticide.

Another method of determining the level of infestation is to walk diagonally across the field and examine 3 or 4 inches at the top of the main-stem terminals of 100 cotton plants, and count the lygus bugs, both adults and nymphs. These examinations should be made at the same intervals and over the same period as the sweep-count examinations.



BN-13917-X

Damage to cotton plant that was exposed to lygus bugs for 7 weeks under a screen.

Selection and application

The accompanying table lists insecticides recommended for control of lygus bugs, and gives rates of application. Consult your State guide before selecting the insecticide, as recommendations are different in different States. For example, Arizona reports that *Lygus hesperus* has developed resistance to DDT, and California reports that lygus bugs in general have developed resistance to many insecticides, such as DDT, endrin, Strobane, and toxaphene.

Dusting

You may apply dust with ground equipment or aircraft. In either case,

Insecticide guide for controlling lygus bugs on cotton

Insecticide	Formulation ¹	Amount of active ingredient to apply per acre
<i>Pounds</i>		
Azinphosmethyl...	D or EC	0.1 to 0.4
Bidrin.....	EC	.1 to .4
Carbaryl.....	D or WP	.7 to 2.0
DDT.....	D or EC	1.0 to 1.5
Endrin.....	D or EC	.1 to .3
Malathion.....	EC	.6 to 1.5
Methyl parathion..	D or EC	.1 to 1.0
Parathion.....	D or EC	1.0
Phosphamidon....	EC	.2 to .5
Strobane.....	D or EC	2.0 to 4.0
Strobane { Strobane..	EC	1.0 to 4.0
+ DDT { DDT....	EC	.5 to 2.0
Toxaphene.....	D or EC	2.0 to 4.0
Toxaphene { Toxa-		
+ DDT { phene..	EC	1.0 to 4.0
{ DDT..	EC	.5 to 2.0
Trichlorfon.....	SP	.25 to 1.0

¹D=dust; EC=emulsifiable concentrate; SP=soluble powder; WP=wettable powder.

the rate of application should be 10 to 15 pounds of dust per acre in southern cotton-growing areas, or 20 to 30 pounds in western areas.

If you apply dust with ground equipment, use one nozzle for each row; set nozzles 6 to 10 inches above tops of the plants.

If you apply dust by airplane, limit the swath width to the plane's wingspan, or not more than 40 feet. Flag or mark the swaths to insure thorough coverage.

If the dust is likely to drift into fields of alfalfa or other crops that would be made unsalable by presence of a residue, apply malathion or methyl parathion.

Dust applications are usually more effective if made in early morning or late afternoon. In desert regions, do not make applications after 10 a.m. or before 4 p.m.

Spraying

Spray materials for use on cotton usually are formulated as emulsifiable concentrates. When mixed with water, they form emulsions that are easily applied with aircraft or ground equipment.

Before preparing a spray, determine the amount of spray your equipment dispenses per acre at a given speed. Mix the concentrate with enough water to insure that the proper amount of active ingredient will be applied to each acre. For example: If your spray machine delivers 8 gallons of spray per acre, and the recommendations specify 4 pints of concentrate per acre, you should mix 4 pints of concentrate with 71½ gallons of water to make 8 gallons of finished spray for each acre to be sprayed.



BN-13918-X

Cotton square and bolls damaged by lygus bugs.

If you spray by aircraft, use nozzles that produce droplets of 100 to 300 microns. Flag the flights; make swaths overlap.

If you use a ground machine, one properly adjusted nozzle for each row will put enough spray on plants in the early fruiting stages to give control. When plants are larger, use two or three nozzles per row. Set the nozzles 6 to 9 inches above tops of the plants. Apply 2 to 10 gallons of spray per acre, at about 60 pounds pressure. Adjust dosage to the size of plants; largest plants require maximum dosage.

BENEFICIAL INSECTS

Several insect predators destroy lygus bugs and help keep them under control. Some important predators in cottonfields are minute pirate bugs, striped collops, the big-eyed bug, and several species of spiders.

These beneficial insects are killed by the same insecticides that kill lygus bugs. Therefore, it is important to apply chemical treatment only when lygus bug populations reach levels that require control.

PRECAUTIONS

Insecticides used improperly can be injurious to man and animals. Use them only when needed and handle them with care. Follow the directions and heed all precautions on the labels.

Some States have special restrictions on the use of certain insecticides. Before applying

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insecticides, check State and local regulations.

Keep insecticides in closed, well-labeled containers in a dry place. Store them where they will not contaminate food or feed, and where children and animals cannot reach them. Promptly dispose of empty insecticide containers; do not use them for any other purpose.

When handling an insecticide, wear clean, dry clothing.

Avoid repeated or prolonged contact of insecticide with your skin.

Wear protective clothing and equipment if specified on the container label. Avoid prolonged inhalation of insecticide dusts or mists.

Avoid spilling an insecticide concentrate on your skin, and keep it out of your eyes, nose, and mouth. If you spill any on your skin or clothing, remove contaminated clothing immediately and wash the skin thoroughly with soap and water. Launder the clothing before wearing it again.

After handling an insecticide, do not eat, drink, or smoke until you have washed your hands and face. Wash any exposed skin immediately after applying an insecticide.

Avoid drift of insecticide to nearby crops, wildlife habitats, bee yards, or livestock. Do not apply insecticides under conditions favoring drift from the area to be treated.

Many insecticides are highly toxic to fish and aquatic animals. Keep insecticides out of all water sources such as ponds, streams, and wells. Do not clean spraying equipment

or dump excess spray material near such water.

Do not apply insecticides to plants during hours when honey bees and other pollinating insects are visiting them. Notify beekeepers at least 48 hours before dusting or spraying so that measures can be taken to protect bees.

Bury empty insecticide containers at a sanitary land fill dump, or crush and bury them at least 18 inches deep in a level, isolated place where they will not contaminate water supplies.

Azinphosmethyl, Bidrin, endrin, methyl parathion, and parathion are highly toxic. Be especially careful when applying them.

Workers entering cottonfields within 5 days after plants have been treated with endrin, or on the day plants are treated with methyl parathion, should wear clean, tightly woven, protective clothing.

Do not graze livestock in cottonfields treated with DDT, endrin, or Strobane, or in fields treated late in the season with azinphosmethyl or toxaphene.

Minimum days to be allowed from last application to harvest are: 1 for azinphosmethyl, 7 for trichlorfon, 10 for Bidrin, and 14 for phosphamidon.

Allow 5 days to pass after using endrin, methyl parathion, and parathion before hand harvesting.

Do not feed livestock gin waste from cotton treated with azinphosmethyl, Bidrin, DDT, endrin, Strobane, or toxaphene.

Controlling Lygus Bugs Plus Spider Mites or Bollworms

If spider mites are a problem in your area, apply a dust containing 40 percent or more sulfur plus carbaryl, DDT, endrin, Strobane, or toxaphene. Or, apply a dust or spray of carbaryl, DDT, endrin, Strobane, or toxaphene, plus a suitable miticide.

To control both lygus bugs and bollworms in areas where lygus bugs are

resistant to DDT, include DDT at dosages recommended for bollworms with any of the other insecticides recommended for lygus bugs except endrin or carbaryl.

Your State guide lists mixtures of insecticides to use for the control of lygus bugs plus other pests.

The Extension Service in each cotton-producing State issues an annual guide for controlling cotton insects. You can get a copy from your county agricultural agent or State agricultural college. If you are in doubt about the kind of cotton-insect control program to follow, consult your county agent.

Prepared by

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